AMENDMENTS TO THE SPECIFICATION:

Please replace the paragraph beginning at page 19, line 20 with the following amended paragraph:

The choice of a carrier material is based on biocompatibility, biodegradability, mechanical properties, cosmetic appearance and interface properties. The particular application of the compositions will define the appropriate formulation. Potential matrices for the compositions may be biodegradable and chemically defined. Preferred matrices include collagen based materials, including sponges, such as ~~Helistat®~~ HELISTAT® (Integra LifeSciences, Plainsboro, N.J.), or collagen in an injectable form, as well as sequestering agents, which may be biodegradable, for example hyaluronic acid derived. Biodegradable materials, such as cellulose films, or surgical meshes, may also serve as matrices. Such material could be sutured into an injury site, or wrapped around the cartilage.

Please replace the paragraph beginning at page 21, line 27 with the following amended paragraph:

Human MMCs were isolated according to previously reported procedure [Journal of Cellular Physiology 176, 57-669(1998)]. Mononuclear cells (MNCs) were isolated from human bone marrow samples according to a modification of a previously reported method [J Cell Physiol 185(1), 98-106(2000).] Total nucleated cells in the marrow sample was diluted to a concentration of 7x106 cells per ml with isolation buffer (calcium and magnesium free phosphate-buffered saline (PBS), 2% bovine serum albumin (BSA), 0.6% sodium citrate and 1% penicillin-streptomycin). Thirty to 35 ml of the diluted cell suspension was layered over 15 ml of ~~Ficoll-Paque~~ FICOLL-PAQUE®

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(Pharmacia, Piscataway, NJ) and centrifuged at 800xg for 20 min. The MNCs were collected, counted, washed with magnetic-activated cell sorting (MACS) buffer (PBS with 0.5% BSA and 2mM EDTA, pH7.2) and resuspended in MACS buffer at 2-4X 108 cells per ml. 1X 108 MNCs were incubated with 0.2 ml of anti-human CD105 antibody-microbeads for 45 min at 4°C and CD105+ cells were isolated using the MS+ columns (Miltenyi Biotec) according to the manufacturer's recommendation. The CD105- cells were collected as the column eluate, while the CD105+ cells remained attached to the column. CD105+ cells were recovered from the column by removing it from the magnet and flushing out the cells with MACS buffer. CD105+ cells were plated in 185 cm^2 ~~Nunclon~~ NUNCLON® Solo flasks (Nunc Inc., Naperville, IL) at a density of 5-7.5X105 cells per flask and cultured in complete medium consisting of Alpha-MEM supplemented with 10% fetal bovine serum (FBS, Hyclone, Logan, UT) and 1% antimycotic-antibiotic at 37°C in 5% CO2 in air. Medium was changed after 48 h and thereafter every 3-4 days. At day 14, cells were detached by incubation with 0.05% trypsin-EDTA and designated primary (p0) and replated for expansion at a density of $1X10^6$ cells per flask as passage 1 cells. The cells reached 90% of confluence in 6-7 days, after which they were either passaged as mentioned, used in other assays or stored in 90% FBS and 10% dimethyl sulphoxide in liquid nitrogen for future use. The cells used for this study were derived from passage 2 or passage 3. The CD105+ were designated MMCs as they are of mesenchymal origin and have multipotential differentiation capability.

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Please replace the paragraph beginning at page 24, line 3 with the following amended paragraph:

Culture-expanded MMCs were encapsulated in alginate beads and cultured in serum-free media. For RNA isolation, the beads were transferred to cell recovery buffer (55mM Sodium Citrate, 0.15M NaCl and 25mM Hepes, pH 7.0), incubated for 10min at 4° C to release the cells from the alginate matrix and centrifuged at 1400 X g for 15 min at 4°C to recover the cells. Total RNA was prepared from the cell pellet by a previously reported procedure [*Journal of Cellular Physiology* **176,** 57-66(1998)]. Briefly, cell pellet was resuspended in lysis buffer (4M guanidinium isothiocynate, 0.03M sodium acetate and 0.4 g/ml of cesium chloride) and the lysate was layered over 5.7M cesium chloride and centrifuged for 18 h at 155,000 X g in a SW40 rotor (Beckman, Palo Alto, CA). The RNA pellet was dissolved in water at 0.5-1 mg/ml. For northern blot analysis, 5 µg of total RNA per sample was fractionated on 1% formaldehyde-agarose gels. Subsequent to electrophoresis, RNA was transferred onto a positive charged nylon membrane, ~~BrightStar~~ BRIGHTSTAR®-Plus (Ambion, Austin, TX). The gene probes for northern analysis was prepared as PCR amplified products using specific oligonucleotide primers as listed in Table I and the amplified products were confirmed by sequencing. These probes were radiolabeled by [α-^{32}P]dCTP (NEN Life Sciences Products) using the random primer method as recommended by the manufacturer (Amersham Pharmacia Biotech Inc., NJ) and hybridized in ultrahyb solution (Ambion) overnight. *Col2A1* hybridization was performed at 54°C and all others were performed at 42°C. The filters were washed in 2xSSC/0.1%SDS at room temperature and then in 0.1xSSC/0.1%SDS at 65°C for 30 min. The filter was exposed to X-ray film overnight. Hybridization signals

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were quantified by scanning the x-ray image and utilizing Image Gauge (Fuji Photo and Film Co, Japan). *Col2A1*, aggrecan, COMP and Sox-9 mRNA levels were corrected for RNA loading by normalization with β2-microglobulin. For detection of *Col2A1* gene expression by reverse transcriptase-polymerase chain reaction (RT-PCR), RNA was prepared from cells isolated from 2-3 solubilized beads by the ~~RNeasy~~ RNEASY® kit (Qiagen, Valencia, CA). RT-PCR was performed using total RNA as a template, oligonucleotide primers, RNA PCR core kit (Perkin-Elmer, Norfolk, CT). The amplified products were analyzed on a 1.2% E-gels (Invitrogen, Carlsbad,CA).

Please replace the paragraph beginning at page 31, line 25 with the following amended paragraph:

Immunohistochemistry was performed to detect the presence of type II collagen protein in the alginate according to a previously reported procedure (Majumdar et al., 2000). Alginate beads from cultures were washed with water and incubated in 100mM barium chloride for 10min for irreversible polymerization. The beads were then washed with water again and fixed in 10% buffered formalin and embedded in paraffin. Sections of alginate beads were incubated with goat anti-type II collagen antibody (Southern Biotechnology Associates, Birmingham, AL). Immunoreactivity was detected by incubating sections with biotinylated anti-goat antibody and horse radish peroxidase H reagents (Vector Laboratories, Burlingame, CA). Signal was developed by treating the sections with peroxidase substrate 3,3'-diaminobenzidine (DAB) and H_2O_2. Images were recorded on 35mm slide film and multipanel figures were made with ~~Photoshop~~ PHOTOSHOP® (Adobe Systems, San Jose, CA). Experimental controls consisted of alginate sections stained with nonimmune primary antibody followed by secondary

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antibody. The results indicate that in comparison to the untreated cells, BMP-2 and BMP-9 treated cells showed a significant presence of type II collagen protein. Type II collagen protein was present in the intercellular region due to the secretion of the protein by the differentiating cells and subsequent entrapment in the alginate matrix. Alginate sections stained with nonimmune primary antibody did not show any immunoreactivity.

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